

Method of Fabricating Semiconductor Device with Separate Periphery and Cell Region Etching Steps

ABSTRACT OF THE DISCLOSURE

Methods of fabricating semiconductor devices using separate periphery and cell region etching steps are provided. A substrate is provided, wherein the substrate has a cell region and a periphery region separated by a shallow trench isolation (STI). The STI is filled with a dielectric material. A protective layer is formed on the periphery region, allowing semiconductor structures to be formed in the cell region without damaging the surface of the periphery region. Upon forming the semiconductor structures in the cell region, a portion of the dielectric material in the STI adjacent to the cell region is partially removed. The dielectric material adjacent to the periphery region is substantially unetched.